Listing of Claims:

What is claimed is:

1.   (Currently amended) In a system for processing data comprising groups of trellis encoded data packets, apparatus for providing trellis decoded data, comprising:

means for generating decision data associated with trellis state transitions in response to said encoded data packets;

a traceback network responsive to said decision data for identifying a sequence of antecedent trellis states, as determined by a state transition trellis, wherein said antecedent trellis states are identified for a sequence of data packets;

means for selecting a desired trellis state path from the antecedent trellis states;

means for ~~substantially~~ continuously updating the desired trellis state path at each new trellis branch; and

means responsive to said identified sequence of antecedent trellis states, for providing said trellis decoded data.

2.   (Original) A system according to claim 1, wherein the traceback network further comprises:

means for performing an all-path traceback through the trellis; and

means for performing an all-path forward trace through the trellis.

3.   (Original) A system according to claim 2, further including means for continuously identifying the desired trellis state path at each new trellis branch

with a forward trace pointer by identifying antecedent trellis states with said decision data.

4.   (Original) A system according to claim 3, wherein the desired trellis state path is a minimum metric path among all trellis states.

5.   (Original) A system according to claim 3, wherein the means for performing an all-path forward trace further comprises:

a first pointer for each trellis state path, the first pointer having a first pointer value, the first pointer value being updated at each new trellis branch throughout the duration of an epoch;

a second pointer for each trellis state path, the second pointer having a second pointer value, the second value being updated at an epoch boundary; and

wherein each epoch is T/2, the traceback interval T defining a survivor memory depth of a decoded data sequence residing within a trellis encoded data sequence.

6.   (Currently amended) A system according to claim 5, wherein the forward trace pointer is continuously responsive to both the first pointer value and the second pointer value, the forward trace pointer thereby being ~~substantially~~ continuously updated at each trellis branch during an epoch.

7.   (Original) A system according to claim 6, wherein the second pointer is updated once at the end of each epoch with the value of the first pointer, and the first pointer is subsequently reset.

8.   (Original) A system according to claim 7, wherein each decoded bit outputted by the system has an associated memory depth of T.

9.   (Original) A system according to claim 8, wherein the forward trace pointer continuously identifies the desired trellis state path from two previous epochs at each new trellis branch.

10.   (Original) A system according to claim 2, wherein the traceback network further comprises:

means for writing the input encoded data into a buffer memory unit in the order of data arrival for an epoch at a time;

means for reading the data from the buffer memory unit during the following epoch and sending it to the all-path traceback unit;

means for sending the decoded outputs from the all-path traceback unit to a decoded sequence memory unit as the all-path traceback unit traces back through the trellis with the data read from the buffer memory unit;

means for reading the decoded data from the decoded sequence memory unit in reverse order of arrival, one epoch at a time;

means for multiplexing the decoded data outputs from the decoded sequence memory unit in order to choose one of N decoded sequences, where N is the number of states in the trellis;

means for selecting a decoded data output sample from the decoded sequence memory via a multiplexer unit according to the value of the forward trace pointer.

11.   (Currently amended) In a system for processing data comprising groups of trellis encoded data jackets, a method comprising the steps of:

generating decision data associated with trellis state transitions in response to said data;

identifying a sequence of antecedent trellis states in accordance with a state transition trellis in response to said decision data;

selecting desired trellis state path in response to characteristics of each trellis branch; and

<u>continuously updating the desired trellis state path at each new trellis</u>
<u>branch; and</u>

providing said trellis decoded data in response to said identified sequence of antecedent trellis states.

12. (Original) A system according to claim 11, further comprising the step of updating desired trellis state path selections between epoch boundaries, wherein each epoch is T/2, the traceback interval T defining a survivor memory depth of a decoded data sequence residing within a trellis encoded data sequence.

13. (Original) A system according to claim 12, further comprising the step of updating and selecting a desired trellis state path at each new trellis branch throughout the duration of an epoch.

14. (Original) A system according to claim 13, further comprising the steps of:

identifying a plurality of trellis decoded data sequences and;

identifying one of the plurality of trellis decoded data sequences with a composite pointer updated at each new trellis branch throughout the duration of an epoch.

15. (Original) A system according to claim 14, further comprising the steps of:

identifying a plurality of trellis decoded data sequences with the help of a first pointer;

updating a value associated with the first pointer at each new trellis branch throughout the duration of an epoch;

identifying a plurality of trellis decoded data sequences with the help of a second pointer; and

updating a value associated with the composite pointer whenever the value associated with the first or the second pointer is updated.

16.   (Original) A system according to claim 15, further comprising the step of replacing at each epoch boundary the value associated with the second pointer with the value associated with the first pointer and subsequently resetting the first pointer.

17.   (Original) A trellis decoder having a plurality of trellis branches and trellis states for decoding encoded symbols, comprising:

means for generating decision data associated with trellis state transitions;

means for providing a plurality of trellis decoded data sequences by identifying a plurality of antecedent trellis state sequences with delayed decision data, as determined by a state transition trellis, the state transition trellis having N states;

means for identifying one of said plurality of trellis decoded data sequences with a pointer updated by identifying antecedent trellis states with said decision data, said pointer being continuously updated at each trellis branch throughout the epoch in response to data associated with each trellis branch, an epoch being subintervals of a traceback interval T.

18.   (Original) A system according to claim 3, wherein the means for performing an all-path forward trace further comprises:

a first pointer, P1, for each trellis state path, the first pointer having a first pointer value, the first pointer value being updated during at each new trellis branch throughout the duration of an epoch;

additional q-1 pointers, Pj, j=2, 3, . . . , q, for each trellis state path, the pointers having pointer values, each pointer value being updated at an epoch boundary; and wherein each epoch is a subinterval of the traceback interval T, with a duration of T/q, where q is an integer greater than or equal to two and q is less than or equal to T, and the traceback interval T defining a survivor memory

depth of a decoded data sequence residing within a trellis encoded data
sequence.

19.   (Original) A system according to claim 18, wherein the forward
trace pointer is continuously responsive to the values of all the q pointers, the
forward trace pointer thereby being substantially continuously updated at each
trellis branch during an epoch.

20.   (Original) A system according to claim 19, wherein each pointer Pj,
j=3, . . . , q, is updated once at the end of each epoch with the value of the
pointer Pj-1, the pointer P2 is updated once at the end of for each epoch with the
value of the pointer P1 and the first pointer, P1, is subsequently reset.

21.   (Original) A system according to claim 20, wherein each decoded
bit residing within a sequence of data outputted by the system has an associated
memory depth of T.

22.   (Original) A system according to claim 21, wherein the forward
trace pointer continuously identifies the desired trellis state path from q previous
epochs at each new trellis branch.

23.   (Currently amended) In a system for processing data comprising
groups of trellis encoded data packets, apparatus for providing trellis decoded
data, comprising:
        means for generating decision data associated with trellis state transitions
in response to said encoded data packets;
        a traceback network responsive to said decision data for identifying a
sequence of antecedent trellis states, as determined by a state transition trellis;
        means for selecting a desired trellis state path from the antecedent trellis
states;

means for <u>continuously</u> updating the desired trellis state path <u>at each new</u>

<u>trellis branch</u>; and

means responsive to said identified sequence of antecedent trellis states,

for providing said trellis decoded data;

wherein the traceback network further comprises:

means for performing an all-path traceback through the trellis; and

means for performing an all-path forward trace through the trellis;

wherein the means for performing an all-path forward trace further

comprises:

a first pointer, P1, for each trellis state path, the first pointer having a first

pointer value, the first pointer value being updated ~~during~~ at each new trellis

branch throughout the duration of an epoch;

additional q-1 pointers, Pj, j=2, 3, . . . , q, for each trellis state path, the

pointers having pointer values, each pointer value being updated at an epoch

boundary; and

wherein each epoch is a subinterval of the traceback interval T, with a

duration of T/q, where q is an integer greater than or equal to two and q is less

than or equal to T, and the traceback interval T defining a survivor memory depth

of a decoded data sequence residing within a trellis encoded data sequence.

24.   (original) A system according to claim 23, wherein a composite

forward trace pointer is responsive to the values of all the q pointers, the

composite forward trace pointer being updated at each epoch boundary.

25.   (Original) A system according to claim 24, wherein each pointer Pj,

j=3, . . . , q, is updated once at the end of each epoch with the value of the

pointer Pj-1, the pointer P2 is updated once at the end of for each epoch with the

value of the pointer P1 and the first pointer, P1, is subsequently reset.

26.   (Currently amended) In a system for processing data comprising

groups of trellis encoded data packets, a method comprising the steps of:

generating decision data associated with trellis state transitions in response to said data;

identifying a sequence of antecedent trellis states in accordance with a state transition trellis in response to said decision data;

selecting desired trellis state path in response to characteristics of each trellis branch;

~~substantially~~ continuously updating the desired trellis state path at each new trellis branch; and

providing said trellis decoded data in response to said identified sequence of antecedent trellis states.